

340003M01

VîBRA

Communications Manual
of the RS485 for the UF

SHINKO DENSHI CO., LTD.

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1. Overview

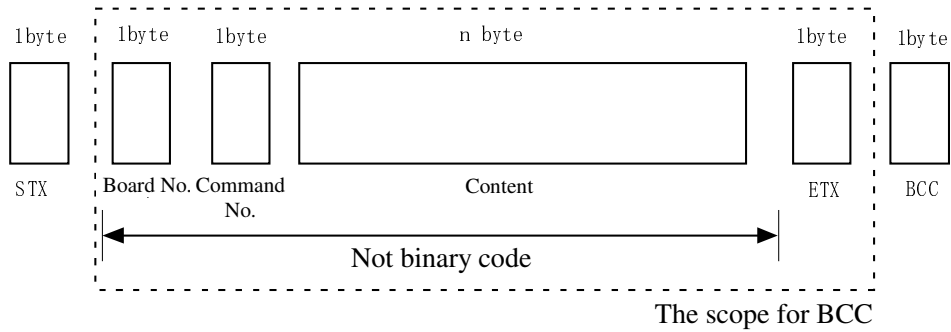
This manual describes communications with the RS485 and includes command descriptions and communication procedures. See “4. Descriptions of commands transmitted to the weight measuring sensor and their corresponding responses” for the command descriptions and “5. Communications between the weight measuring sensor and the indicator at power-on” through “8. Span adjustment” for the communication procedures.

UF weight measuring sensors (UF) can send weight data and perform zero adjustment after they receive those commands. Hereinafter, the UF weight measuring sensor (UF) is referred to as “weight measuring sensor” and the display unit (UD-1) is “indicator.”

RS485 (half-duplex) is used for communication between the weight measuring sensor and the indicator.

2. Basic format

2.1 Command and data



2.2 Calculating BCC (LRC)

The scope for BCC is the content between STX and ETX (non inclusive).

LRC is even parity check.

The XORed value of all relevant digits is used for LRC.

2.3 Board No. (communication ID)

The communication ID is determined based on the setting of DIP switches on the weight measuring sensor. When the DIP switches are set to zero, they receive commands regardless of the communication ID. When connecting multiple weight measuring sensors, the DIP switches should not be set to zero.

Dip switch	Communication ID	Dip switch	Communication ID
	Code		Code
1	31h	9	39h
2	32h	10	3Ah
3	33h	11	3Bh
4	34h	12	3Ch
5	35h	13	3Dh
6	36h	14	3Eh
7	37h	15	3Fh
8	38h		

3. Communication specifications

Baud rate	19200 bps
Character length	7 bits
Parity	even number
Start bit	1 bit
Stop bit	1 bit

4. Descriptions of commands transmitted to the weight measuring sensor and their corresponding responses

See “2. Basic format” for the format of transmitted commands and corresponding responses.

4.1 Requesting weight data

4.1.1 Transmitted command (weight request command)

(1) Content of transmission

+0	+1	+2	+3	+4	+5	+6	+7
02h (STX)	Board No. (communication ID)	41h (Command No.)	20h (Type of weight data)	20h	20h (Specifying parameters for the weight)	03h (ETX)	BCC

4.1.2 Responses (weight data)

(1) Content of response

+0	+1	+2	+3	+4 to +13	+14 to +15	+16 to +19	+20	+20
02h (STX)	Board No. (communication ID)	40h (Command No.)	20h (Type of weight data)	Weight data	Unit	Status	03h (ETX)	BCC

(2) Details of responses: Weight data

No.	Meaning	Description
+4	Polarity	+ (2Bh): Positive - (2Dh): Negative
+5 to +13	Data	- High-order digits that are not used are zero. (zero, 0x30) - Figures are right justified. - The last digit may be a space. - Decimal points are included. - Numeric ASCII

(3) Details of responses: Unit

No.	Description
+14	22h: g
+15	20h

(4) Details of responses: Status

No.	Description
+16	b0: Zero point (before and after tare) b1: Zero point (after tare) b2: Stable/Unstable (=false: unstable, =true: stable) b3: Upper limit of the tare range exceeded b4: In the process of deducting tare b5: 1 (fixed) b6: Zero point (before tare) b7: Not used
+17	b0-b3 (Status & error codes): 0: Invalid status 1: Around zero (+5d or less) 2: In the process of weighing (exceeding +5d after deducting zero) 4: +Capacity 1% over 6: Over Range Err (outside of the range of the sensor) 7: Under Range Err (outside of the range of the sensor) b4: Updating the weight (=0: same as the previous time, =1: new weight data) b5: 1 (fixed) b6: (Reserved) b7: Not used
+18	b3: (Reserved) b5: 1 (fixed) b6: Formatted flag b7: Not used
+19	b5: 1 (fixed) b7: Not used

4.2 Requesting zero adjustment/tare

4.2.1 Transmitted command (commands for zero adjustment/tare)

(1) Content of transmission

+0	+1	+2	+3	+4	+5
02h (STX)	Board No. (communication ID)	4Bh (Command No.)	Setting operation	03h (ETX)	BCC

(2) Details of transmitted content: Setting operation

Code	Description
20h	Operation according to the setting of the weight measuring sensor
21h	No stability wait
22h	Stability wait
23h	Forced capture
24h	Cancel

4.2.2 Responses

These are the responses to received commands, not processed results. See “4.4 Requesting confirmation on the operation status (requesting special status)” for processed results.

(1) Negative acknowledgment

+0	+1	+2	+3	+4	+5	+6
02h (STX)	Board No. (communication ID)	30h (Command No.)	4Bh (Command type)	40h (Invalid command)	03h (ETX)	BCC

(2) Acknowledgement

+0	+1	+2	+3	+4	+5	+6
02h (STX)	Board No. (communication ID)	31h (Command No.)	4Bh (Command type)	20h (Begin normally)	03h (ETX)	BCC

4.3 Requesting span adjustment

4.3.1 Transmitted command (request to beginning the span adjustment)

(1) Content of transmission

+0	+1	+2	+3	+4	+5	+6
02h (STX)	Board No. (communication ID)	4Dh (Command No.)	23h (Calibration using an external weight)	Setting operation	03h (ETX)	BCC

(2) Details of transmitted content: Setting operation

Code	Description
20h	Execute span adjustment
23h	Forced capture
24h	Cancel

4.3.2 Responses

(1) Negative acknowledgment

+0	+1	+2	+3	+4	+5	+6
02h (STX)	Board No. (communication ID)	30h (Command No.)	4Dh (Command No.)	Code	03h (ETX)	BCC

(2) Details of negative acknowledgment: Code

Code	Description
40h	Invalid command
41h	Invalid setting of operation (Currently in stability wait. 20h is specified as the operation setting while executing span adjustment. 23h or 24h is specified as the operation setting without executing CAL.)
42h	Unable to respond because it is busy

(3) Acknowledgement

+0	+1	+2	+3	+4	+5	+6
02h (STX)	Board No. (communication ID)	31h (Command No.)	4Dh (Command No.)	20h (Begin normally)	03h (ETX)	BCC

4.4 Requesting confirmation on the operation status (requesting special status)

This is a command for confirming that the operation has been completed after sending zero adjustment/tare and span adjustment commands.

4.4.1 Transmitted command (command for requesting special status)

(1) Content of transmission

+0	+1	+2	+3	+4	+5
02h (STX)	Board No. (communication ID)	49h (Command No.)	22h (Specifying requested data)	03h (ETX)	BCC

4.4.2 Responses

(1) Descriptions

+0	+1	+2	+3	+4	+5 to +22	+23	+24
02h (STX)	Board No. (communication ID)	45h (Command No.)	22h (Data type)	29h (The number of bytes of original data)	Data	03h (ETX)	BCC

(2) Details of responses: Data

No.	Description	Allocation							
		b7	b6	b5	b4	b3	b2	b1	b0
+5 to +8	Error	0	0	1	0	Undefined			
+9	Stability wait	0	0	1	0	Currently in stability wait	4: Zero adjustment/tare		
+10		0	0	1	0	b: Zero adjustment/tare			
+11	Status of the result	0	0	1	0	0			
+12		0	0	1	0	0: Normal termination (Executed) 1: Abnormal termination (Not executed)			
+13	Specifying the type	0	0	1	0	Calibrating	2: CAL		
+14		0	0	1	0	3: CAL			
+15	Status of the result	0	0	1	0	0: Normal termination (updating the factor) 0: Abnormal termination, cancellation, terminated with an error (not updating the factor)			
+16		0	0	1	0	0: Normal termination (updating the factor) 1: STOP, 2: 1-Err, 3: 2-Err			
+17	Middle sequence	0	0	1	0	Numbers starting from zero corresponding to the weight load			
+18		0	0	1	0	Currently in stability wait. 1: PushF 2: Flashing			
+19 to +22	Other	0	0	1	0	Undefined			

4.5 Requesting read of function setting values

This is a command for reading the function setting values of the weight measuring sensor.

4.5.1 Transmitted command (command for requesting read of function setting values)

(1) Content of transmission

+0	+1	+2	+3	+4	+5	+6	+7
02h (STX)	Board No. (communication ID)	51h (Command No.)	20h (Read)	Item No. (large classification)	Item No. (small classification)	03h (ETX)	BCC

(2) Details of transmitted content: Item No. (large and small classifications)

+4	+5	Item name
'A' (41h)	'0' (30h)	Auto zero
'A' (41h)	'1' (31h)	Range for determining stability
'A' (41h)	'2' (32h)	Number of times of determining stability
'A' (41h)	'3' (33h)	Response speed 1
'A' (41h)	'4' (34h)	Response speed 2 Selecting weight FIR
'A' (41h)	'5' (35h)	Tare
'A' (41h)	'6' (36h)	Retaining the tare
'B' (42h)	'0' (30h)	Handling of instability of 1d change
'B' (42h)	'1' (31h)	Output interval Weight update interval
'C' (43h)	'0' (30h)	Span adjustment/span test
'D' (44h)	'0' (30h)	Indicating the unit
'D' (44h)	'1' (31h)	Specifying the minimum indication
'I' (49h)	'1' (31h)	Output control
'I' (49h)	'2' (32h)	Baud rate
'I' (49h)	'3' (33h)	Parity
'I' (49h)	'4' (34h)	Data length
'I' (49h)	'5' (35h)	Stop bit

4.5.2 Responses

(1) Descriptions

+0	+1	+2	+3	+4	+5 to +8	+9	+24
02h (STX)	Board No. (communication ID)	45h (Command No.)	21h (Data type)	22h (The number of bytes of original data)	Data	03h (ETX)	BCC

(2) Details of responses: Data

No.	Descriptions		
+5	ItemNo. (large classification)	As for 4.5.1(2)	
+6	ItemNo. (small classification)		
+7	Setting values (function indicated values)	20h + high-order digits of the setting value	(Ex.) When the function indicated value is 1: +7: 20h (20h + 0h) +8: 21h (20h + 1h)
+8		20h + low-order digits of the setting value	

4.6 Requesting write of function setting values

This is a command for setting functions of the weight measuring sensor.

4.6.1 Transmitted command (command for requesting write of function setting values)

(1) Content of transmission

+0	+1	+2	+3	+4	+5	+6 to +7	+8	+9
02h (STX)	Board No. (communication ID)	51h (Command No.)	21h (Write)	Item No. (large classification)	Item No. (small classification)	WRITE data	03h (ETX)	BCC

(2) Details of transmitted content: Item No. (large and small classifications)

Same as 4.5.1(2).

(3) Details of transmitted content: WRITE data

No.	Description	
+6	20h + high-order digits	- Content to be written (function indicated value) - 2-digit ASCII
+7	20h + low-order digits	(Ex.) When the function indicated value is 1...+6: 20h (20h + 0h) +7: 21h (20h + 1h)

4.6.2 Responses

(1) Negative acknowledgment

+0	+1	+2	+3	+4	+5	+6
02h (STX)	Board No. (communication ID)	30h (Command No.)	51h (Command type)	Code	03h (ETX)	BCC

(2) Details of negative acknowledgment: Code

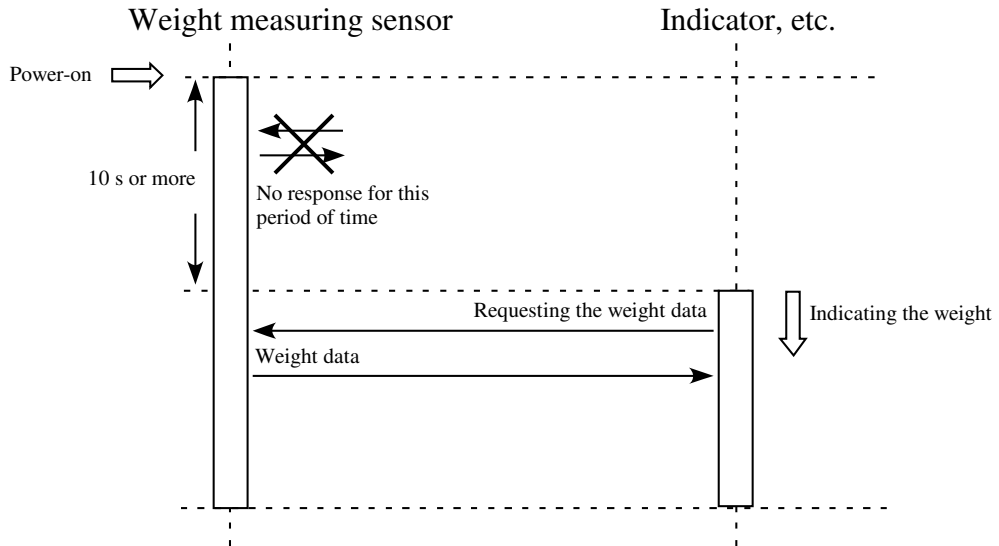
Code	Description
21h	The item No. is invalid.
22h	The WRITE data is out of scope.

(3) Acknowledgement

+0	+1	+2	+3	+4	+5	+6
02h (STX)	Board No. (communication ID)	31h (Command No.)	51h (Command type)	20h (Begin normally)	03h (ETX)	BCC

5. Communications between the weight measuring sensor and the indicator at power-on

No commands should be sent to the weight measuring sensor for ten seconds after power-on.



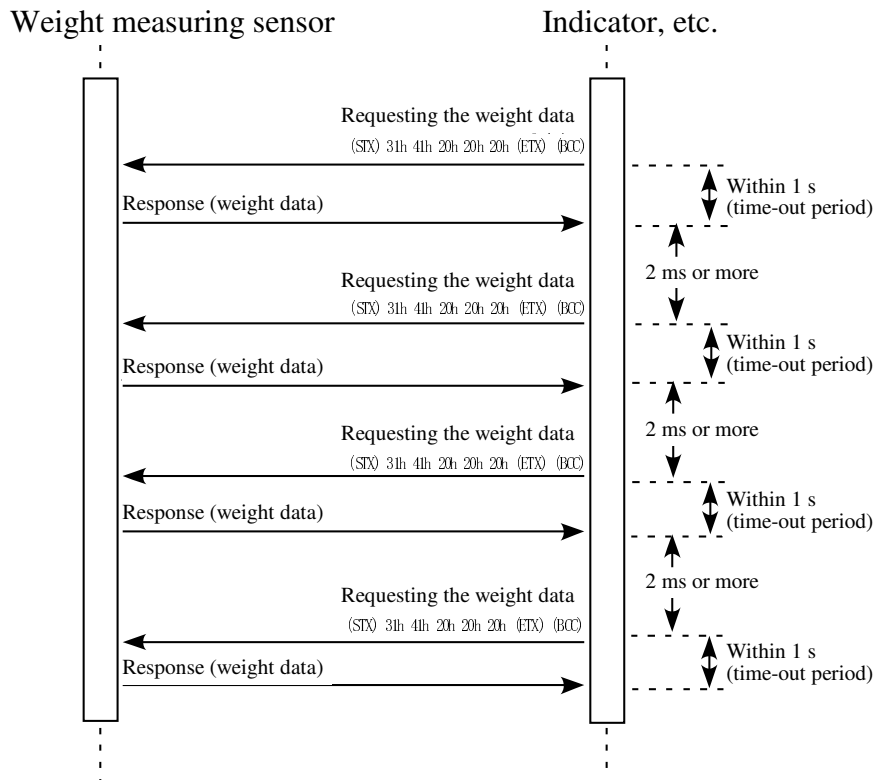
6. Weight data

The following is an example of a transmitted command for obtaining the weight data from the weight measuring sensor.

The transmission interval of commands should be set based on the update interval of the weight on the weight measuring sensor.

Ex.) The update interval of the weight: 0.04 s The transmission interval of commands: 40 ms

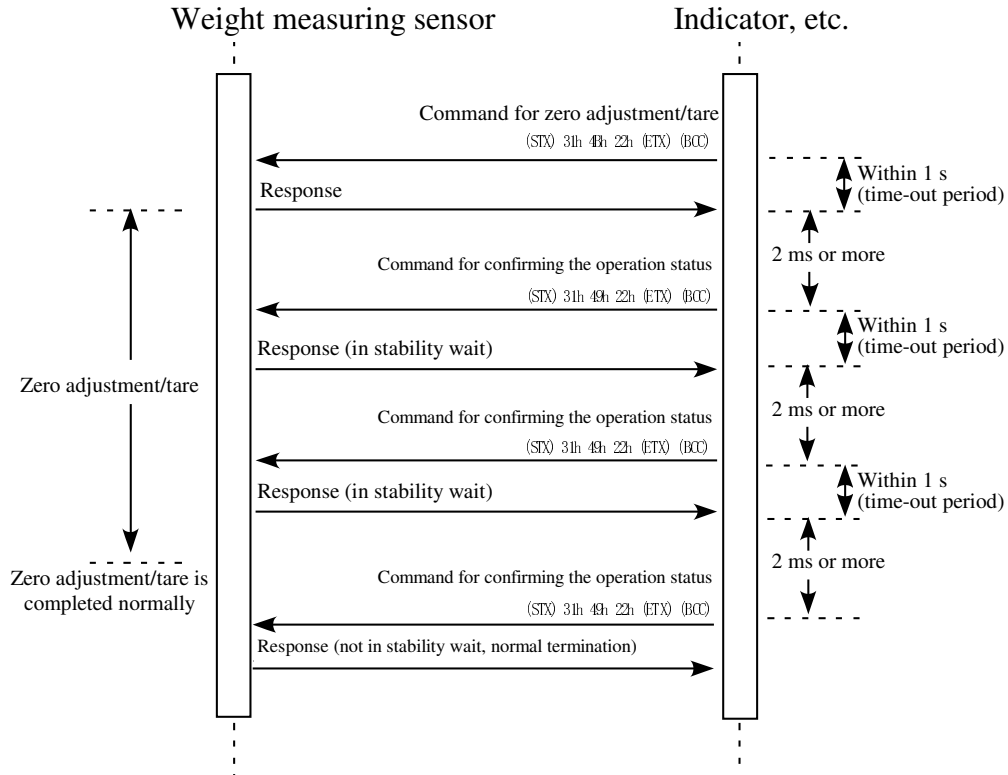
Board No. (communication ID): 31h



7. Zero adjustment/tare

The following is an example of a transmitted command for zero adjustment/tare.

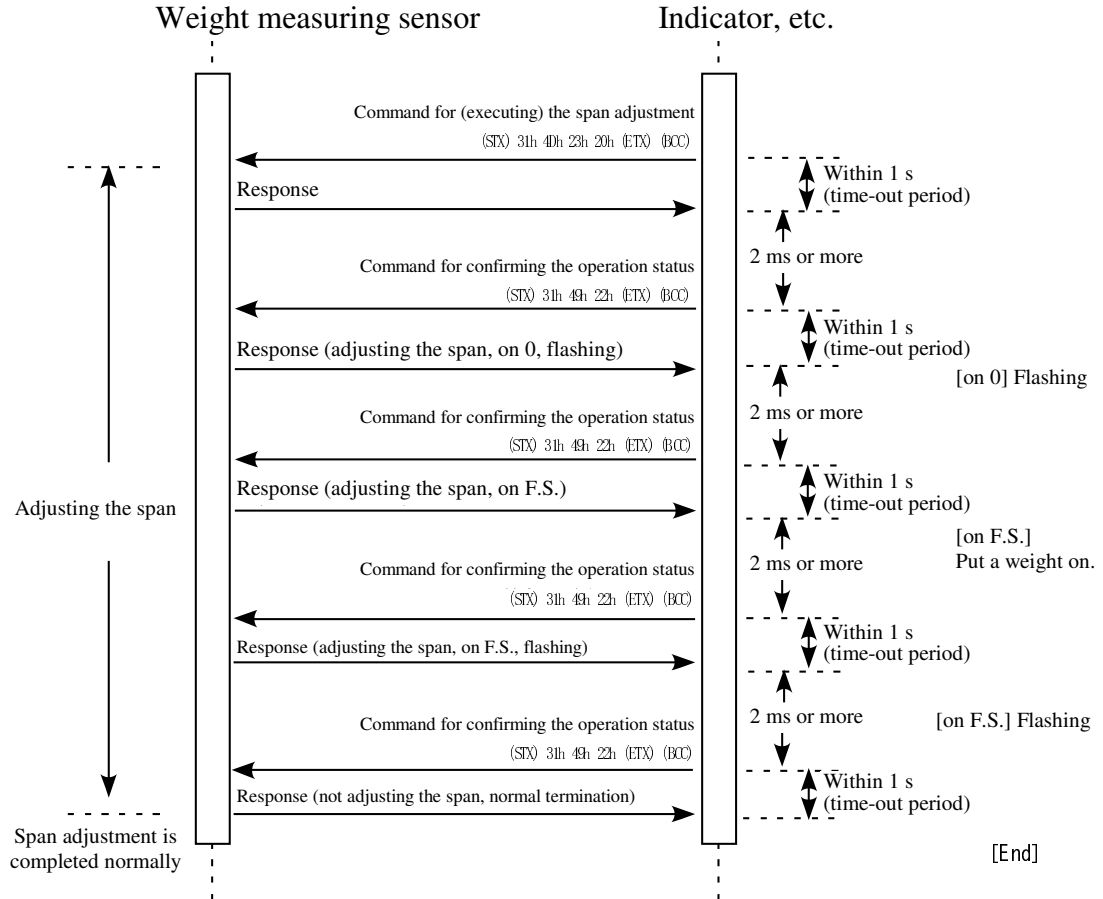
Board No. (communication ID): 31h



8. Span adjustment

The following is an example of a transmitted command for the span adjustment.

Board No. (communication ID): 31h



9. Electrically connected section

Power supply voltage: +24 VDC \pm 10%

Consumption current: 0.1 A

Connection interface: RS485

Connector terminal Nos. on the weight measuring sensor side and their functions

Terminal No.	Description
1	Power source +24 V
2	RS232C RXD
3	RS232C TXD
4	Power source GND
5	Signal GND
6	External tare
7	Frame GND
8	RS485 A
9	RS485 B

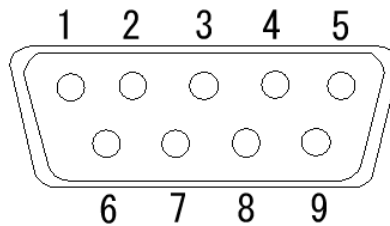


Figure: Connector pin configuration on the weight measuring sensor side for Dsub-9P male